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=> file caplus
COST IN U.S. DOLLARS                              SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.21       0.21

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FILE COVERS 1907 - 6 Dec 2002  VOL 137 ISS 24
FILE LAST UPDATED: 5 Dec 2002  (20021205/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.

CAS roles have been modified effective December 16, 2001. Please
check your SDI profiles to see if they need to be revised. For
information on CAS roles, enter HELP ROLES at an arrow prompt or use
the CAS Roles thesaurus (/RL field) in this file.

=> s armor
          2089 ARMOR
           107 ARMORS
L1        2127 ARMOR
                 (ARMOR OR ARMORS)

=> s polymeric (l)material
        163064 POLYMERIC
            26 POLYMERICS
        163081 POLYMERIC
                 (POLYMERIC OR POLYMERICS)
       1143213 MATERIAL
       1510048 MATERIALS
       2293236 MATERIAL
                 (MATERIAL OR MATERIALS)
L2       32999 POLYMERIC (L)MATERIAL

=> s bullet proof or projectile proof
          1223 BULLET
           707 BULLETS
          1632 BULLET
                 (BULLET OR BULLETS)
         29816 PROOF
          1529 PROOFS
         30933 PROOF
                 (PROOF OR PROOFS)
            81 BULLET PROOF
                 (BULLET(W)PROOF)
         12843 PROJECTILE
          6733 PROJECTILES
         16675 PROJECTILE
                 (PROJECTILE OR PROJECTILES)
```

```
         29816 PROOF
          1529 PROOFS
         30933 PROOF
                 (PROOF OR PROOFS)
             1 PROJECTILE PROOF
                 (PROJECTILE(W)PROOF)
L3          82 BULLET PROOF OR PROJECTILE PROOF

=> s impregnate or soak
          3067 IMPREGNATE
           308 IMPREGNATES
          3353 IMPREGNATE
                 (IMPREGNATE OR IMPREGNATES)
          2504 SOAK
           384 SOAKS
          2816 SOAK
                 (SOAK OR SOAKS)
L4        6166 IMPREGNATE OR SOAK

=> s assembly or composite or laminate
        102384 ASSEMBLY
         25337 ASSEMBLIES
        118387 ASSEMBLY
                 (ASSEMBLY OR ASSEMBLIES)
        232485 COMPOSITE
        140552 COMPOSITES
        265090 COMPOSITE
                 (COMPOSITE OR COMPOSITES)
         74571 LAMINATE
         56005 LAMINATES
         91828 LAMINATE
                 (LAMINATE OR LAMINATES)
L5      456133 ASSEMBLY OR COMPOSITE OR LAMINATE

=> d his

     (FILE 'HOME' ENTERED AT 11:50:05 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 11:50:38 ON 06 DEC 2002
L1          2127 S ARMOR
L2         32999 S POLYMERIC (L)MATERIAL
L3            82 S BULLET PROOF OR PROJECTILE PROOF
L4          6166 S IMPREGNATE OR SOAK
L5        456133 S ASSEMBLY OR COMPOSITE OR LAMINATE

=> s l1 and l2 and l4 and l5
L6             0 L1 AND L2 AND L4 AND L5

=> s l2 and l3 and l4 and l5
L7             0 L2 AND L3 AND L4 AND L5

=> s l1 and l2 and l3
L8             0 L1 AND L2 AND L3

=> s l1 and l2 and l5
L9             6 L1 AND L2 AND L5

=> d l9 1-6 bib, abs

L9   ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2002:864317  CAPLUS
DN   137:356908
TI   Method for making boron carbide containing ceramics in the form of films,
     fibers, and nanostructured materials
```

IN Sneddon, Larry G.; Pender, Mark J.
PA Trustees of the University of Pennsylvania, USA
SO U.S., 14 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6478994	B1	20021112	US 2000-539182	20000330

AB The method for making a boron carbide contg. ceramic involves pyrolyzing a precursor having .gtoreq.1 monosubstituted decaboranyl groups and .gtoreq.1 substituting group contg. carbon. The precursor may be mol., e.g., comprising two decaboranyl groups linked by a single substituting group, or **polymeric**, in which case the decaboranyl groups are part of the pendant group of the polymer while a portion of the substituting group makes up the polymer backbone. Examples of the precursor are 1-Polyhexenyldecaborane, dipropyldecaboranyl, polyallyldimethylsilanepropyldecaborane, and copolymer of allyltrimethylsilane and hexenyldecaborane. In either case, the substituting group may be a hydrocarbon, in which case boron carbide may be formed. Alternatively, the substituting group may contain carbon and another ceramic forming element (i.e., other than boron or carbon), such as silicon, nitrogen, or phosphorous, in which case a **composite** including boron carbide is formed. The precursors are relatively stable in air, allow access to both boron rich and carbon rich **materials** , and further allow for the formation of films, fibers, and nanostructured **materials** more easily than other precursors. The resulting ceramic is suitable as an abrasive wear-resistant **material**, ceramic **armor**, a neutron moderator in nuclear reactors, and potentially, for power generation in deep space flight applications.
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 2001:814980 CAPLUS
DN 137:94399
TI Carbon, polyethylene and PBO hybrid fiber **composites** for structural lightweight **armor**
AU Larsson, Fritz; Svensson, Lars
CS Protection and Materials Department, Weapons and Protection Division, Swedish Defence Research Agency, Tumba, SE-147 25, Swed.
SO Composites, Part A: Applied Science and Manufacturing (2001), Volume Date 2002, 33A(2), 221-231
CODEN: CASMFJ; ISSN: 1359-835X
PB Elsevier Science Ltd.
DT Journal
LA English
AB The mech. and impact properties of hybrid **composite materials** based on epoxy resin, Araldite LY-5052 and carbon fibers (T300), S-2- glass fibers, Aramid fibers, SK-66 and polyethylene fiber fabrics, and Zylon AS (polybenzobisoxazole) (PBO) were studied, with a view to using these **materials** in lightwt. structural **armor**. **Laminates** were manufd. by resin transfer molding and specific ballistic properties and specific compressive strength after impact were detd. The **polymeric** fibers contributed to improved ballistic properties of **composites**. The specific compressive strength decreased slightly, but was more than compensated for by the improved residual impact energy and impact strength.
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 2001:185838 CAPLUS

```
DN    134:223771
TI    Waste glass **composites** and their manufacture
IN    Roddis, James
PA    Sheffield Hallam University, UK
SO    PCT Int. Appl., 34 pp.
      CODEN: PIXXD2
DT    Patent
LA    English
FAN.CNT 1
      PATENT NO.          KIND  DATE             APPLICATION NO.  DATE
      ---------------     ----  --------         ---------------  --------
PI    WO 2001018100        A1   20010315         WO 2000-GB3347   20000901
          W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
              CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
              HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
              LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
              SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
              YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
          RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
              DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
              CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
      EP 1218442           A1   20020703          EP 2000-956697   20000901
          R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, IE,
              SI, LT, LV, FI, RO, MK, CY, AL
PRAI GB 1999-20843        A     19990904
      WO 2000-GB3347       W     20000901
AB    Title solid composites, with high mech. strength useful for
      floor materials, body armors, and radiation-resistant articles
      (from high Pb- and/or Ba-contg. glass wastes), comprise glass granules and
      binder resins.  A compn. comprising an epoxy resin (bisphenol A and F,
      alkyl glycidyl ethers, and epoxysilane coupler) 11.17,
      octahydro-4,7-methano-1H-indendimethylamine5.65, a pigment 0.06, 0-4 mm
      pulverized waste glass 42.66, and 4-6 mm pulverized waste glass 40.46%
      gave a composite with high impact resistance (with penetration
      0-0.5 mm).
RE.CNT  3      THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
               ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9    ANSWER 4 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN    2000:205672  CAPLUS
DN    132:238343
TI    Penetration-resistant and knife-proof polybenzazole fabric material
IN    Nomura, Yukihiro
PA    Toyobo Co., Ltd., Japan
SO    Jpn. Kokai Tokkyo Koho, 6 pp.
      CODEN: JKXXAF
DT    Patent
LA    Japanese
FAN.CNT 1
      PATENT NO.          KIND  DATE             APPLICATION NO.  DATE
      ---------------     ----  --------         ---------------  --------
PI    JP 2000088497        A2   20000331         JP 1998-261620   19980916
AB    The material is a multilayer laminate (basis wt. 3000-6000 g/m2)
      of cloth (basis wt. 100-1000 g/m2) of polybenzaole fibers with tensile
      strength 30 g/d.

L9    ANSWER 5 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN    1999:83522  CAPLUS
DN    130:223873
TI    Confined compression of elastic adhesives at high rates of strain
AU    Martinez, M. A.; Chocron, I. S.; Rodriguez, J.; Galvez, V. Sanchez;
      Sastre, L. A.
CS    Departamento de Ingenieria (Area de Materiales), Escuela Politecnica
      Superior, Universidad Carlos III de Madrid, Madrid, 280911, Spain
```

SO International Journal of Adhesion and Adhesives (1998), 18(6), 375-383
CODEN: IJAADK; ISSN: 0143-7496
PB Elsevier Science Ltd.
DT Journal
LA English
AB Elastic adhesives are used in **composite armors** to bond the ceramic front face and the metallic backing plate. The mech. behavior of different elastic adhesives under impact loads have been studied by means of dynamic compression tests performed in a split Hopkinson pressure bar. In these expts., the stress-strain curve of confined materials at high strain rates and the capability of transmitting and reflecting the impact energy have been detd. The influence of thickness and aging on the response of the adhesive layer have been also considered.
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 1991:248377 CAPLUS
DN 114:248377
TI Ballistic energy absorption of **composites**
AU Lin, L. C.; Bhatnagar, A.; Chang, H. W.
CS Allied-Signal, Inc., Petersburg, VA, 23804, USA
SO International SAMPE Technical Conference (1990), 22(Adv. Mater.), 1-13
CODEN: ISTCEF; ISSN: 0892-2624
DT Journal
LA English
AB The energy absorption of a ballistic projectile against a **composite armor** material was a complex combination of the striking velocity, energy dissipation during the penetration, projectile characteristics, and the material properties of the target. Five types of fragment-simulated projectiles were used to generate the energy absorption data and 3 types of **composite armors** were studied: ultra-high-mol.-wt. polyethylene/vinyl ester/polyurethane, aramide/phenolic resin/poly(vinyl butyral), and S-2 glass fiber/phenolic resin/poly(vinyl butyral). From the test data, a simple math. model was developed based on striking energy, diam. of the projectile, and characteristics of the target **composite armor** materials.

=> log y

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	35.64	35.85

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-3.72	-3.72

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                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

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FILE COVERS 1907 - 6 Dec 2002  VOL 137 ISS 24
FILE LAST UPDATED: 5 Dec 2002  (20021205/ED)

  This file contains CAS Registry Numbers for easy and accurate
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check your SDI profiles to see if they need to be revised. For
information on CAS roles, enter HELP ROLES at an arrow prompt or use
the CAS Roles thesaurus (/RL field) in this file.

=> s armor
          2089 ARMOR
           107 ARMORS
L1        2127 ARMOR
                 (ARMOR OR ARMORS)

=> s polymeric (l)material
        163064 POLYMERIC
            26 POLYMERICS
        163081 POLYMERIC
                 (POLYMERIC OR POLYMERICS)
       1143213 MATERIAL
       1510048 MATERIALS
       2293236 MATERIAL
                 (MATERIAL OR MATERIALS)
L2       32999 POLYMERIC (L)MATERIAL

=> s bullet proof or projectile proof
          1223 BULLET
           707 BULLETS
          1632 BULLET
                 (BULLET OR BULLETS)
         29816 PROOF
          1529 PROOFS
         30933 PROOF
                 (PROOF OR PROOFS)
            81 BULLET PROOF
                 (BULLET(W)PROOF)
         12843 PROJECTILE
          6733 PROJECTILES
         16675 PROJECTILE
                 (PROJECTILE OR PROJECTILES)
```

```
        29816 PROOF
         1529 PROOFS
        30933 PROOF
                (PROOF OR PROOFS)
            1 PROJECTILE PROOF
                (PROJECTILE(W)PROOF)
L3         82 BULLET PROOF OR PROJECTILE PROOF

=> s impregnate or soak
         3067 IMPREGNATE
          308 IMPREGNATES
         3353 IMPREGNATE
                (IMPREGNATE OR IMPREGNATES)
         2504 SOAK
          384 SOAKS
         2816 SOAK
                (SOAK OR SOAKS)
L4       6166 IMPREGNATE OR SOAK

=> s assembly or composite or laminate
       102384 ASSEMBLY
        25337 ASSEMBLIES
       118387 ASSEMBLY
                (ASSEMBLY OR ASSEMBLIES)
       232485 COMPOSITE
       140552 COMPOSITES
       265090 COMPOSITE
                (COMPOSITE OR COMPOSITES)
        74571 LAMINATE
        56005 LAMINATES
        91828 LAMINATE
                (LAMINATE OR LAMINATES)
L5     456133 ASSEMBLY OR COMPOSITE OR LAMINATE

=> d his

     (FILE 'HOME' ENTERED AT 11:50:05 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 11:50:38 ON 06 DEC 2002
L1         2127 S ARMOR
L2        32999 S POLYMERIC (L)MATERIAL
L3           82 S BULLET PROOF OR PROJECTILE PROOF
L4         6166 S IMPREGNATE OR SOAK
L5       456133 S ASSEMBLY OR COMPOSITE OR LAMINATE

=> s l1 and l2 and l4 and l5
L6            0 L1 AND L2 AND L4 AND L5

=> s l2 and l3 and l4 and l5
L7            0 L2 AND L3 AND L4 AND L5

=> s l1 and l2 and l3
L8            0 L1 AND L2 AND L3

=> s l1 and l2 and l5
L9            6 L1 AND L2 AND L5

=> d l9 1-6 bib, abs

L9   ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2002:864317  CAPLUS
DN   137:356908
TI   Method for making boron carbide containing ceramics in the form of films,
     fibers, and nanostructured materials
```

IN Sneddon, Larry G.; Pender, Mark J.
PA Trustees of the University of Pennsylvania, USA
SO U.S., 14 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6478994	B1	20021112	US 2000-539182	20000330

AB The method for making a boron carbide contg. ceramic involves pyrolyzing a precursor having .gtoreq.1 monosubstituted decaboranyl groups and .gtoreq.1 substituting group contg. carbon. The precursor may be mol., e.g., comprising two decaboranyl groups linked by a single substituting group, or **polymeric**, in which case the decaboranyl groups are part of the pendant group of the polymer while a portion of the substituting group makes up the polymer backbone. Examples of the precursor are 1-Polyhexenyldecaborane, dipropyldecaboranyl, polyallyldimethylsilanepropyldecaborane, and copolymer of allyltrimethylsilane and hexenyldecaborane. In either case, the substituting group may be a hydrocarbon, in which case boron carbide may be formed. Alternatively, the substituting group may contain carbon and another ceramic forming element (i.e., other than boron or carbon), such as silicon, nitrogen, or phosphorous, in which case a **composite** including boron carbide is formed. The precursors are relatively stable in air, allow access to both boron rich and carbon rich **materials**, and further allow for the formation of films, fibers, and nanostructured **materials** more easily than other precursors. The resulting ceramic is suitable as an abrasive wear-resistant **material**, ceramic **armor**, a neutron moderator in nuclear reactors, and potentially, for power generation in deep space flight applications.
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 2001:814980 CAPLUS
DN 137:94399
TI Carbon, polyethylene and PBO hybrid fiber **composites** for structural lightweight **armor**
AU Larsson, Fritz; Svensson, Lars
CS Protection and Materials Department, Weapons and Protection Division, Swedish Defence Research Agency, Tumba, SE-147 25, Swed.
SO Composites, Part A: Applied Science and Manufacturing (2001), Volume Date 2002, 33A(2), 221-231
CODEN: CASMFJ; ISSN: 1359-835X
PB Elsevier Science Ltd.
DT Journal
LA English
AB The mech. and impact properties of hybrid **composite materials** based on epoxy resin, Araldite LY-5052 and carbon fibers (T300), S-2- glass fibers, Aramid fibers, SK-66 and polyethylene fiber fabrics, and Zylon AS (polybenzobisoxazole) (PBO) were studied, with a view to using these **materials** in lightwt. structural **armor**. **Laminates** were manufd. by resin transfer molding and specific ballistic properties and specific compressive strength after impact were detd. The **polymeric** fibers contributed to improved ballistic properties of **composites**. The specific compressive strength decreased slightly, but was more than compensated for by the improved residual impact energy and impact strength.
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 3 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 2001:185838 CAPLUS

```
DN    134:223771
TI    Waste glass composites and their manufacture
IN    Roddis, James
PA    Sheffield Hallam University, UK
SO    PCT Int. Appl., 34 pp.
      CODEN: PIXXD2
DT    Patent
LA    English
FAN.CNT 1
      PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
      ---------------   ----  --------      ---------------  --------
PI    WO 2001018100      A1   20010315      WO 2000-GB3347   20000901
          W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
              CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
              HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
              LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
              SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
              YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
          RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
              DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
              CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
      EP 1218442         A1   20020703      EP 2000-956697   20000901
          R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, IE,
              SI, LT, LV, FI, RO, MK, CY, AL
PRAI GB 1999-20843       A    19990904
      WO 2000-GB3347     W    20000901
AB    Title solid composites, with high mech. strength useful for
      floor materials, body armors, and radiation-resistant articles
      (from high Pb- and/or Ba-contg. glass wastes), comprise glass granules and
      binder resins.  A compn. comprising an epoxy resin (bisphenol A and F,
      alkyl glycidyl ethers, and epoxysilane coupler) 11.17,
      octahydro-4,7-methano-1H-indendimethylamine5.65, a pigment 0.06, 0-4 mm
      pulverized waste glass 42.66, and 4-6 mm pulverized waste glass 40.46%
      gave a composite with high impact resistance (with penetration
      0-0.5 mm).
RE.CNT  3       THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
                ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9    ANSWER 4 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN    2000:205672  CAPLUS
DN    132:238343
TI    Penetration-resistant and knife-proof polybenzazole fabric material
IN    Nomura, Yukihiro
PA    Toyobo Co., Ltd., Japan
SO    Jpn. Kokai Tokkyo Koho, 6 pp.
      CODEN: JKXXAF
DT    Patent
LA    Japanese
FAN.CNT 1
      PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
      ---------------   ----  --------      ---------------  --------
PI    JP 2000088497      A2   20000331      JP 1998-261620   19980916
AB    The material is a multilayer laminate (basis wt. 3000-6000 g/m2)
      of cloth (basis wt. 100-1000 g/m2) of polybenzaole fibers with tensile
      strength 30 g/d.

L9    ANSWER 5 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN    1999:83522  CAPLUS
DN    130:223873
TI    Confined compression of elastic adhesives at high rates of strain
AU    Martinez, M. A.; Chocron, I. S.; Rodriguez, J.; Galvez, V. Sanchez;
      Sastre, L. A.
CS    Departamento de Ingenieria (Area de Materiales), Escuela Politecnica
      Superior, Universidad Carlos III de Madrid, Madrid, 280911, Spain
```

SO International Journal of Adhesion and Adhesives (1998), 18(6), 375-383
CODEN: IJAADK; ISSN: 0143-7496
PB Elsevier Science Ltd.
DT Journal
LA English
AB Elastic adhesives are used in **composite armors** to bond the ceramic front face and the metallic backing plate. The mech. behavior of different elastic adhesives under impact loads have been studied by means of dynamic compression tests performed in a split Hopkinson pressure bar. In these expts., the stress-strain curve of confined materials at high strain rates and the capability of transmitting and reflecting the impact energy have been detd. The influence of thickness and aging on the response of the adhesive layer have been also considered.
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 6 OF 6 CAPLUS COPYRIGHT 2002 ACS
AN 1991:248377 CAPLUS
DN 114:248377
TI Ballistic energy absorption of **composites**
AU Lin, L. C.; Bhatnagar, A.; Chang, H. W.
CS Allied-Signal, Inc., Petersburg, VA, 23804, USA
SO International SAMPE Technical Conference (1990), 22(Adv. Mater.), 1-13
CODEN: ISTCEF; ISSN: 0892-2624
DT Journal
LA English
AB The energy absorption of a ballistic projectile against a **composite armor** material was a complex combination of the striking velocity, energy dissipation during the penetration, projectile characteristics, and the material properties of the target. Five types of fragment-simulated projectiles were used to generate the energy absorption data and 3 types of **composite armors** were studied: ultra-high-mol.-wt. polyethylene/vinyl ester/polyurethane, aramide/phenolic resin/poly(vinyl butyral), and S-2 glass fiber/phenolic resin/poly(vinyl butyral). From the test data, a simple math. model was developed based on striking energy, diam. of the projectile, and characteristics of the target **composite armor** materials.

```
=> log y
COST IN U.S. DOLLARS                          SINCE FILE      TOTAL
                                                   ENTRY    SESSION
FULL ESTIMATED COST                                35.64      35.85

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)    SINCE FILE      TOTAL
                                                   ENTRY    SESSION
CA SUBSCRIBER PRICE                                -3.72      -3.72

STN INTERNATIONAL LOGOFF AT 11:54:09 ON 06 DEC 2002


=> FILE CAPLUS
COST IN U.S. DOLLARS                          SINCE FILE      TOTAL
                                                   ENTRY    SESSION
FULL ESTIMATED COST                                 0.21       0.21

FILE 'CAPLUS' ENTERED AT 13:37:57 ON 06 DEC 2002
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FILE COVERS 1907 - 6 Dec 2002  VOL 137 ISS 24
FILE LAST UPDATED: 5 Dec 2002  (20021205/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.

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check your SDI profiles to see if they need to be revised. For
information on CAS roles, enter HELP ROLES at an arrow prompt or use
the CAS Roles thesaurus (/RL field) in this file.

=> s assembly or composite or laminate
        102384 ASSEMBLY
         25337 ASSEMBLIES
        118387 ASSEMBLY
                 (ASSEMBLY OR ASSEMBLIES)
        232485 COMPOSITE
        140552 COMPOSITES
        265090 COMPOSITE
                 (COMPOSITE OR COMPOSITES)
         74571 LAMINATE
         56005 LAMINATES
         91828 LAMINATE
                 (LAMINATE OR LAMINATES)
L1      456133 ASSEMBLY OR COMPOSITE OR LAMINATE

=> s polymeric (l) material
        163064 POLYMERIC
            26 POLYMERICS
        163081 POLYMERIC
                 (POLYMERIC OR POLYMERICS)
       1143213 MATERIAL
       1510048 MATERIALS
       2293236 MATERIAL
                 (MATERIAL OR MATERIALS)
L2       32999 POLYMERIC (L) MATERIAL

=> s impregnate or soak
          3067 IMPREGNATE
           308 IMPREGNATES
          3353 IMPREGNATE
                 (IMPREGNATE OR IMPREGNATES)
          2504 SOAK
           384 SOAKS
          2816 SOAK
                 (SOAK OR SOAKS)
L3        6166 IMPREGNATE OR SOAK

=> s armor
          2089 ARMOR
           107 ARMORS
L4        2127 ARMOR
                 (ARMOR OR ARMORS)

=> s bullet(l) proof or projectile (l)proof
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```
        1223 BULLET
         707 BULLETS
        1632 BULLET
               (BULLET OR BULLETS)
       29816 PROOF
        1529 PROOFS
       30933 PROOF
               (PROOF OR PROOFS)
          85 BULLET(L) PROOF
       12843 PROJECTILE
        6733 PROJECTILES
       16675 PROJECTILE
               (PROJECTILE OR PROJECTILES)
       29816 PROOF
        1529 PROOFS
       30933 PROOF
               (PROOF OR PROOFS)
          37 PROJECTILE (L)PROOF
L5       114 BULLET(L) PROOF OR PROJECTILE (L)PROOF

=> d his

     (FILE 'HOME' ENTERED AT 13:37:22 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 13:37:57 ON 06 DEC 2002
L1       456133 S ASSEMBLY OR COMPOSITE OR LAMINATE
L2        32999 S POLYMERIC (L) MATERIAL
L3         6166 S IMPREGNATE OR SOAK
L4         2127 S ARMOR
L5          114 S BULLET(L) PROOF OR PROJECTILE (L)PROOF

=> s l1 and l2 and l4
L6            6 L1 AND L2 AND L4

=> s l1 and l2 and l5
L7            1 L1 AND L2 AND L5

=> d l7 bib,abs

L7   ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2002 ACS
AN   1973:101402  CAPLUS
DN   78:101402
TI   Glass laminates
IN   Mertens, Helmut
SO   Ger. Offen., 22 pp.
     CODEN: GWXXBX
DT   Patent
LA   German
FAN.CNT 1
     PATENT NO.        KIND  DATE           APPLICATION NO.  DATE
     ---------------   ----  --------       ---------------  --------
PI   DE 2134750         A1   19730201       DE 1971-2134750  19710712
     DE 2134750         B2   19730705
     BE 786191          A1   19730112       BE 1972-119790   19720712
     FR 2145636         A1   19730223       FR 1972-25266    19720712
PRAI DE 1971-2134750         19710712
AB   Glass laminates, used for curved windshields and bullet
     -proof or pressure-resistant plates, were made from .gtoreq.2
     inorg. and (or) org. glass plates (such as polyethylene), contg.
     polymeric profile strips at 1-2 edges for distancing and
     tightening, by filling the interspace with monomeric material,
     e.g. Me methacrylate, deaerating, and polymg.  Thus, a cylindrically
     curved windshield made from 2 glass plates and Me methacrylate interlayer
     had good transparency and adhesive strength.
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=> d l6 1-6 bib,abs

L6   ANSWER 1 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2002:864317  CAPLUS
DN   137:356908
TI   Method for making boron carbide containing ceramics in the form of films,
     fibers, and nanostructured materials
IN   Sneddon, Larry G.; Pender, Mark J.
PA   Trustees of the University of Pennsylvania, USA
SO   U.S., 14 pp.
     CODEN: USXXAM
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.        KIND  DATE           APPLICATION NO.   DATE
     ---------------   ----  --------       ---------------   --------
PI   US 6478994         B1   20021112       US 2000-539182    20000330
AB   The method for making a boron carbide contg. ceramic involves pyrolyzing a
     precursor having .gtoreq.1 monosubstituted decaboranyl groups and
     .gtoreq.1 substituting group contg. carbon.  The precursor may be mol.,
     e.g., comprising two decaboranyl groups linked by a single substituting
     group, or polymeric, in which case the decaboranyl groups are
     part of the pendant group of the polymer while a portion of the
     substituting group makes up the polymer backbone.  Examples of the
     precursor are 1-Polyhexenyldecaborane, dipropyldecaboranyl,
     polyallyldimethylsilanepropyldecaborane, and copolymer of
     allyltrimethylsilane and hexenyldecaborane.  In either case, the
     substituting group may be a hydrocarbon, in which case boron carbide may
     be formed.  Alternatively, the substituting group may contain carbon and
     another ceramic forming element (i.e., other than boron or carbon), such
     as silicon, nitrogen, or phosphorous, in which case a composite
     including boron carbide is formed.  The precursors are relatively stable
     in air, allow access to both boron rich and carbon rich materials
     , and further allow for the formation of films, fibers, and nanostructured
     materials more easily than other precursors.  The resulting
     ceramic is suitable as an abrasive wear-resistant material,
     ceramic armor, a neutron moderator in nuclear reactors, and
     potentially, for power generation in deep space flight applications.
RE.CNT  13    THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6   ANSWER 2 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2001:814980  CAPLUS
DN   137:94399
TI   Carbon, polyethylene and PBO hybrid fiber composites for
     structural lightweight armor
AU   Larsson, Fritz; Svensson, Lars
CS   Protection and Materials Department, Weapons and Protection Division,
     Swedish Defence Research Agency, Tumba, SE-147 25, Swed.
SO   Composites, Part A: Applied Science and Manufacturing (2001), Volume Date
     2002, 33A(2), 221-231
     CODEN: CASMFJ; ISSN: 1359-835X
PB   Elsevier Science Ltd.
DT   Journal
LA   English
AB   The mech. and impact properties of hybrid composite
     materials based on epoxy resin, Araldite LY-5052 and carbon fibers
     (T300), S-2- glass fibers, Aramid fibers, SK-66 and polyethylene fiber
     fabrics, and Zylon AS (polybenzobisoxazole) (PBO) were studied, with a
     view to using these materials in lightwt. structural
     armor.  Laminates were manufd. by resin transfer molding
     and specific ballistic properties and specific compressive strength after
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impact were detd. The **polymeric** fibers contributed to improved ballistic properties of **composites**. The specific compressive strength decreased slightly, but was more than compensated for by the improved residual impact energy and impact strength.

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6   ANSWER 3 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2001:185838  CAPLUS
DN   134:223771
TI   Waste glass composites and their manufacture
IN   Roddis, James
PA   Sheffield Hallam University, UK
SO   PCT Int. Appl., 34 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.         KIND  DATE            APPLICATION NO.  DATE
     ---------------    ----  --------        ---------------  --------
PI   WO 2001018100       A1   20010315        WO 2000-GB3347   20000901
         W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
            CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
            HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
            LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
            SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
            YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
        RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
            DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ,
            CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
     EP 1218442          A1   20020703        EP 2000-956697   20000901
         R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, IE,
            SI, LT, LV, FI, RO, MK, CY, AL
PRAI GB 1999-20843       A    19990904
     WO 2000-GB3347      W    20000901
```

AB Title solid **composites**, with high mech. strength useful for floor materials, body **armors**, and radiation-resistant articles (from high Pb- and/or Ba-contg. glass wastes), comprise glass granules and binder resins. A compn. comprising an epoxy resin (bisphenol A and F, alkyl glycidyl ethers, and epoxysilane coupler) 11.17, octahydro-4,7-methano-1H-indendimethylamine5.65, a pigment 0.06, 0-4 mm pulverized waste glass 42.66, and 4-6 mm pulverized waste glass 40.46% gave a **composite** with high impact resistance (with penetration 0-0.5 mm).

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L6   ANSWER 4 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   2000:205672  CAPLUS
DN   132:238343
TI   Penetration-resistant and knife-proof polybenzazole fabric material
IN   Nomura, Yukihiro
PA   Toyobo Co., Ltd., Japan
SO   Jpn. Kokai Tokkyo Koho, 6 pp.
     CODEN: JKXXAF
DT   Patent
LA   Japanese
FAN.CNT 1
     PATENT NO.         KIND  DATE            APPLICATION NO.  DATE
     ---------------    ----  --------        ---------------  --------
PI   JP 2000088497       A2   20000331        JP 1998-261620   19980916
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AB The material is a multilayer **laminate** (basis wt. 3000-6000 g/m2) of cloth (basis wt. 100-1000 g/m2) of polybenzaole fibers with tensile strength 30 g/d.

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L6   ANSWER 5 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   1999:83522  CAPLUS
DN   130:223873
TI   Confined compression of elastic adhesives at high rates of strain
AU   Martinez, M. A.; Chocron, I. S.; Rodriguez, J.; Galvez, V. Sanchez;
     Sastre, L. A.
CS   Departamento de Ingenieria (Area de Materiales), Escuela Politecnica
     Superior, Universidad Carlos III de Madrid, Madrid, 280911, Spain
SO   International Journal of Adhesion and Adhesives (1998), 18(6), 375-383
     CODEN: IJAADK; ISSN: 0143-7496
PB   Elsevier Science Ltd.
DT   Journal
LA   English
AB   Elastic adhesives are used in composite armors to bond
     the ceramic front face and the metallic backing plate.  The mech. behavior
     of different elastic adhesives under impact loads have been studied by
     means of dynamic compression tests performed in a split Hopkinson pressure
     bar.  In these expts., the stress-strain curve of confined materials at
     high strain rates and the capability of transmitting and reflecting the
     impact energy have been detd.  The influence of thickness and aging on the
     response of the adhesive layer have been also considered.
RE.CNT  12     THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
               ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6   ANSWER 6 OF 6  CAPLUS  COPYRIGHT 2002 ACS
AN   1991:248377  CAPLUS
DN   114:248377
TI   Ballistic energy absorption of composites
AU   Lin, L. C.; Bhatnagar, A.; Chang, H. W.
CS   Allied-Signal, Inc., Petersburg, VA, 23804, USA
SO   International SAMPE Technical Conference (1990), 22(Adv. Mater.), 1-13
     CODEN: ISTCEF; ISSN: 0892-2624
DT   Journal
LA   English
AB   The energy absorption of a ballistic projectile against a
     composite armor material was a complex combination of
     the striking velocity, energy dissipation during the penetration,
     projectile characteristics, and the material properties of the target.
     Five types of fragment-simulated projectiles were used to generate the
     energy absorption data and 3 types of composite armors
     were studied: ultra-high-mol.-wt. polyethylene/vinyl ester/polyurethane,
     aramide/phenolic resin/poly(vinyl butyral), and S-2 glass fiber/phenolic
     resin/poly(vinyl butyral).  From the test data, a simple math. model was
     developed based on striking energy, diam. of the projectile, and
     characteristics of the target composite armor
     materials.


=> d his

     (FILE 'HOME' ENTERED AT 13:37:22 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 13:37:57 ON 06 DEC 2002
L1       456133 S ASSEMBLY OR COMPOSITE OR LAMINATE
L2        32999 S POLYMERIC (L) MATERIAL
L3         6166 S IMPREGNATE OR SOAK
L4         2127 S ARMOR
L5          114 S BULLET(L) PROOF OR PROJECTILE (L)PROOF
L6            6 S L1 AND L2 AND L4
L7            1 S L1 AND L2 AND L5

=> s heavy duty cloth material
        292505 HEAVY
```

```
           79 HEAVIES
       292559 HEAVY
                (HEAVY OR HEAVIES)
         8903 DUTY
          623 DUTIES
         9485 DUTY
                (DUTY OR DUTIES)
        29177 CLOTH
         4907 CLOTHS
        31369 CLOTH
                (CLOTH OR CLOTHS)
      1143213 MATERIAL
      1510048 MATERIALS
      2293236 MATERIAL
                (MATERIAL OR MATERIALS)
L8            0 HEAVY DUTY CLOTH MATERIAL
                (HEAVY(W)DUTY(W)CLOTH(W)MATERIAL)

=> s heavy (l) duty (l) cloth (l)material
       292505 HEAVY
           79 HEAVIES
       292559 HEAVY
                (HEAVY OR HEAVIES)
         8903 DUTY
          623 DUTIES
         9485 DUTY
                (DUTY OR DUTIES)
        29177 CLOTH
         4907 CLOTHS
        31369 CLOTH
                (CLOTH OR CLOTHS)
      1143213 MATERIAL
      1510048 MATERIALS
      2293236 MATERIAL
                (MATERIAL OR MATERIALS)
L9            6 HEAVY (L) DUTY (L) CLOTH (L)MATERIAL

=> s kevlar or spectra
         3044 KEVLAR
            3 KEVLARS
         3045 KEVLAR
                (KEVLAR OR KEVLARS)
       950507 SPECTRA
           93 SPECTRAS
       950551 SPECTRA
                (SPECTRA OR SPECTRAS)
L10      953489 KEVLAR OR SPECTRA

=> d his

     (FILE 'HOME' ENTERED AT 13:37:22 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 13:37:57 ON 06 DEC 2002
L1        456133 S ASSEMBLY OR COMPOSITE OR LAMINATE
L2         32999 S POLYMERIC (L) MATERIAL
L3          6166 S IMPREGNATE OR SOAK
L4          2127 S ARMOR
L5           114 S BULLET(L) PROOF OR PROJECTILE (L)PROOF
L6             6 S L1 AND L2 AND L4
L7             1 S L1 AND L2 AND L5
L8             0 S HEAVY DUTY CLOTH MATERIAL
L9             6 S HEAVY (L) DUTY (L) CLOTH (L)MATERIAL
L10       953489 S KEVLAR OR SPECTRA
```

```
=> s l1 and l2 and l10 and l4
L11          0 L1 AND L2 AND L10 AND L4

=> s l4 and l10 and l1
L12         32 L4 AND L10 AND L1

=> s glass or glass ceramics or spinel or polymethylmethacrylate
        592189 GLASS
        111071 GLASSES
        617690 GLASS
                 (GLASS OR GLASSES)
        592189 GLASS
        111071 GLASSES
        617690 GLASS
                 (GLASS OR GLASSES)
        150973 CERAMICS
             1 CERAMICSES
        150973 CERAMICS
                 (CERAMICS OR CERAMICSES)
         13538 GLASS CERAMICS
                 (GLASS(W)CERAMICS)
         33261 SPINEL
          7940 SPINELS
         35514 SPINEL
                 (SPINEL OR SPINELS)
          2646 POLYMETHYLMETHACRYLATE
            13 POLYMETHYLMETHACRYLATES
          2658 POLYMETHYLMETHACRYLATE
                 (POLYMETHYLMETHACRYLATE OR POLYMETHYLMETHACRYLATES)
L13     653089 GLASS OR GLASS CERAMICS OR SPINEL OR POLYMETHYLMETHACRYLATE

=> s l12 and l13
L14         10 L12 AND L13

=> d hi
'HI' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'

The following are valid formats:

ABS --------- GI and AB
ALL --------- BIB, AB, IND, RE
APPS -------- AI, PRAI
BIB --------- AN, plus Bibliographic Data and PI table (default)
CAN --------- List of CA abstract numbers without answer numbers
CBIB -------- AN, plus Compressed Bibliographic Data
DALL -------- ALL, delimited (end of each field identified)
DMAX -------- MAX, delimited for post-processing
FAM --------- AN, PI and PRAI in table, plus Patent Family data
FBIB -------- AN, BIB, plus Patent FAM
IND --------- Indexing data
IPC --------- International Patent Classifications
MAX --------- ALL, plus Patent FAM, RE
PATS -------- PI, SO
SAM --------- CC, SX, TI, ST, IT
SCAN -------- CC, SX, TI, ST, IT (random display, no answer numbers;
              SCAN must be entered on the same line as the DISPLAY,
              e.g., D SCAN or DISPLAY SCAN)
STD --------- BIB, IPC, and NCL

IABS -------- ABS, indented with text labels
IALL -------- ALL, indented with text labels
IBIB -------- BIB, indented with text labels
IMAX -------- MAX, indented with text labels
ISTD -------- STD, indented with text labels
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OBIB -------- AN, plus Bibliographic Data (original)
OIBIB ------- OBIB, indented with text labels

SBIB -------- BIB, no citations
SIBIB ------- IBIB, no citations

HIT --------- Fields containing hit terms
HITIND ------ IC, ICA, ICI, NCL, CC and index field (ST and IT)
              containing hit terms
HITRN ------- HIT RN and its text modification
HITSTR ------ HIT RN, its text modification, its CA index name, and
              its structure diagram
HITSEQ ------ HIT RN, its text modification, its CA index name, its
              structure diagram, plus NTE and SEQ fields
FHITSTR ----- First HIT RN, its text modification, its CA index name, and
              its structure diagram
FHITSEQ ----- First HIT RN, its text modification, its CA index name, its
              structure diagram, plus NTE and SEQ fields
KWIC -------- Hit term plus 20 words on either side
OCC --------- Number of occurrence of hit term and field in which it occurs

To display a particular field or fields, enter the display field
codes.  For a list of the display field codes, enter HELP DFIELDS at
an arrow prompt (=>).  Examples of formats include: TI; TI,AU; BIB,ST;
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specification.

All of the formats (except for SAM, SCAN, HIT, HITIND, HITRN, HITSTR,
FHITSTR, HITSEQ, FHITSEQ, KWIC, and OCC) may be used with DISPLAY ACC
to view a specified Accession Number.
ENTER DISPLAY FORMAT (BIB):end

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     (FILE 'HOME' ENTERED AT 13:37:22 ON 06 DEC 2002)

     FILE 'CAPLUS' ENTERED AT 13:37:57 ON 06 DEC 2002
L1        456133 S ASSEMBLY OR COMPOSITE OR LAMINATE
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L6             6 S L1 AND L2 AND L4
L7             1 S L1 AND L2 AND L5
L8             0 S HEAVY DUTY CLOTH MATERIAL
L9             6 S HEAVY (L) DUTY (L) CLOTH (L)MATERIAL
L10       953489 S KEVLAR OR SPECTRA
L11            0 S L1 AND L2 AND L10 AND L4
L12           32 S L4 AND L10 AND L1
L13       653089 S GLASS OR GLASS CERAMICS OR SPINEL OR POLYMETHYLMETHACRYLATE
L14           10 S L12 AND L13

=> d 14 1-10 bib,abs

L4   ANSWER 1 OF 2127  CAPLUS  COPYRIGHT 2002 ACS
AN   2002:914169  CAPLUS
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DN 137:355059
TI Lightweight ballistic projectiles with improved penetration
IN Rabu, Yann
PA Fr.
SO Fr. Demande, 5 pp.
CODEN: FRXXBL
DT Patent
LA French
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2820816	A3	20020816	FR 2001-2075	20010215

AB The projectiles have an **armor** point of Cu, treated to increase the power of penetration upon impact; this also assures improved solidity of the projectile upon impact. The amt. of W in the cap is very high. The projectiles are fabricated by cold pressing; the internal core comprises compressed bronze and copper powder and is <100 .mu. in size, and the bullet is Pb with W ballast. Fine grooves provide stabilization of the projectile. The projectiles can be used for law enforcement or by armies as well as in target practice or leisure shooting.

L4 ANSWER 2 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:876928 CAPLUS
TI Properties, use and health effects of depleted uranium (DU): a general overview
AU Bleise, A.; Danesi, P. R.; Burkart, W.
CS Wagramer Strasse 5, International Atomic Energy Agency (IAEA), Department of Nuclear Science and Applications, P.O. Box 100, Vienna, A-1400, Austria
SO Journal of Environmental Radioactivity (2003), 64(2-3), 93-112
CODEN: JERAEE; ISSN: 0265-931X
PB Elsevier Science Ltd.
DT Journal
LA English
AB Depleted uranium (DU), a waste product of uranium enrichment, has several civilian and military applications. It was used as **armor** -piercing ammunition in international military conflicts and was claimed to contribute to health problems, known as the Gulf War Syndrome and recently as the Balkan Syndrome. This led to renewed efforts to assess the environmental consequences and the health impact of the use of DU. The radiol. and chem. properties of DU can be compared to those of natural uranium, which is ubiquitously present in soil at a typical concn. of 3 mg/kg. Natural uranium has the same chemotoxicity, but its radiotoxicity is 60% higher. Due to the low specific radioactivity and the dominance of alpha-radiation no acute risk is attributed to external exposure to DU. The major risk is DU dust, generated when DU ammunition hits hard targets. Depending on aerosol speciation, inhalation may lead to a protracted exposure of the lung and other organs. After deposition on the ground, resuspension can take place if the DU contg. particle size is sufficiently small. However, transfer to drinking water or locally produced food has little potential to lead to significant exposures to DU. Since poor soly. of uranium compds. and lack of information on speciation precludes the use of radioecol. models for exposure assessment, biomonitoring has to be used for assessing exposed persons. Urine, feces, hair and nails record recent exposures to DU. With the exception of crews of military vehicles having been hit by DU penetrators, no body burdens above the range of values for natural uranium have been found. Therefore, observable health effects are not expected and residual cancer risk ests. have to be based on theor. considerations. They appear to be very minor for all post-conflict situations, i.e. a fraction of those expected from natural radiation.

L4 ANSWER 3 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:864317 CAPLUS
DN 137:356908
TI Method for making boron carbide containing ceramics in the form of films,

fibers, and nanostructured materials
IN Sneddon, Larry G.; Pender, Mark J.
PA Trustees of the University of Pennsylvania, USA
SO U.S., 14 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6478994	B1	20021112	US 2000-539182	20000330

AB The method for making a boron carbide contg. ceramic involves pyrolyzing a precursor having .gtoreq.1 monosubstituted decaboranyl groups and .gtoreq.1 substituting group contg. carbon. The precursor may be mol., e.g., comprising two decaboranyl groups linked by a single substituting group, or polymeric, in which case the decaboranyl groups are part of the pendant group of the polymer while a portion of the substituting group makes up the polymer backbone. Examples of the precursor are 1-Polyhexenyldecaborane, dipropyldecaboranyl, polyallyldimethylsilanepropyldecaborane, and copolymer of allyltrimethylsilane and hexenyldecaborane. In either case, the substituting group may be a hydrocarbon, in which case boron carbide may be formed. Alternatively, the substituting group may contain carbon and another ceramic forming element (i.e., other than boron or carbon), such as silicon, nitrogen, or phosphorous, in which case a composite including boron carbide is formed. The precursors are relatively stable in air, allow access to both boron rich and carbon rich materials, and further allow for the formation of films, fibers, and nanostructured materials more easily than other precursors. The resulting ceramic is suitable as an abrasive wear-resistant material, ceramic **armor**, a neutron moderator in nuclear reactors, and potentially, for power generation in deep space flight applications.
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:856774 CAPLUS
DN 137:341117
TI Lightweight ceramic tile having bulletproof shape
IN Sotoike, Yoshinobu; Imaeda, Naoki
PA Toray Industries, Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002326861	A2	20021112	JP 2001-137067	20010508

AB The title ceramic tile has polygonal shape with higher thickness at summits than its center. The tile is esp. suitable for **armor** plates, bulletproof vests, etc.

L4 ANSWER 5 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:852566 CAPLUS
TI Dynamic recrystallization-induced flow phenomena in tungsten-tantalum (4%) [001] single-crystal rod ballistic penetrators
AU Trillo, E. A.; Esquivel, E. V.; Murr, L. E.; Magness, L. S.
CS Department of Metallurgical and Materials Engineering, University of Texas at El Paso, El Paso, TX, 79968, USA
SO Materials Characterization (2002), 48(5), 407-421
CODEN: MACHEX; ISSN: 1044-5803
PB Elsevier Science Inc.
DT Journal

LA English
AB Deformation-flow microstructures assocd. with [001] W-4% Ta penetrator fragments in a rolled homogeneous steel **armor** target exhibit dynamic recrystn. The equiaxed, recrystd. grain structure obsd. in the deformed penetrator is also assocd. with soft zones in corresponding microhardness maps. Microstructure evolution is also examd. by transmission electron microscopy (TEM) and selected-area electron diffraction (SAED).

L4 ANSWER 6 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:850291 CAPLUS
DN 137:339000
TI Quasi-unidirectional fabric for ballistic applications
IN Cunningham, David Verlin; Pritchard, Laura E.
PA Can.
SO U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002164911	A1	20021107	US 2002-135573	20020501
PRAI	US 2001-288568P	P	20010503		

AB A ballistic fabric has unidirectional ballistic-resistant yarns in .gtoreq.2 layers. The layers are at 90 .+-. 5.degree. with respect to each other. The ballistic-resistant yarns are stabilized by being woven in a second fabric formed of yarns having a substantially lower tenacity and tensile modulus than the ballistic-resistant yarns. Thus, a woven fabric of 1330 dtex Spectra warp/fill fibers and 78 dtex nylon warp/fill fibers had V-50 ballistic performance rating 328 m/s; vs. 280 m/s for the control of elastomer coated Spectra fibers.

L4 ANSWER 7 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:840833 CAPLUS
TI Prestressed ceramics and improvement of impact resistance
AU Bao, Yiwang; Su, Shengbiao; Yang, Jianjun; Fan, Qisheng
CS China, China Building Materials Academy, Beijing, PR, 100024, USA
SO Materials Letters (2002), 57(2), 518-524
CODEN: MLETDJ; ISSN: 0167-577X
PB Elsevier Science B.V.
DT Journal
LA English
AB The shrink-fit technique has been used to study the effect of prestress and confinement on ceramic materials. Calcn. of prestress in ceramics tile wrapped by metal and optimized design for the composite are presented. Alumina tile confined with aluminum alloy, which was in a state of triaxial compression, was chosen as the target in impact tests to investigate the impact resistance of prestressed ceramics. The results from two types of impact tests indicate that both impact resistance and **armor**-piercing resistance are greatly enhanced due to the presence of prestress and compact confinements, and that triaxial prestress is much better than biaxial prestress for enhancing the impact resistance of ceramics.

L4 ANSWER 8 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:832736 CAPLUS
DN 137:339661
TI High-energy-density composite explosive containing thermite composition dispersed in primary high explosive
IN Jones, John W.
PA Lockheed Martin Corporation, USA
SO PCT Int. Appl., 27 pp.
CODEN: PIXXD2

DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002085816	A2	20021031	WO 2002-US12477	20020423

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2001-840909 A 20010425

AB A high-energy-d. explosive, esp. suitable for high penetration, consists of a reducing metal and a metal oxide (e.g., a thermite system) dispersed throughout a conventional (primary) high explosive. The av. d. of the metal oxide and the reducing metal is .gtoreq.1.95 g/cm3. Upon detonation of the primary explosive, the thermite reaction occurs at a rate that is about the same as the detonation rate of the primary explosive (e.g., about 6 mm/.mu.s), and the thermite reaction is completed within 1 ms. The particle sizes of the thermite components are selected to tailor a peak detonation pressure of the payload. Suitable primary explosives include TNT, RDX, plastic-bonded explosives, and AFX-type explosives. A polymer binder (e.g., a fluoropolymer) is present to bind the primary explosive and the thermite components together; in addn., the thermite components are bound together by a metal oxide, preferably B2O3. Suitable thermite components include Al, Zr, Al-Zr alloy, and Al-Zr intermetallic (as the metals) and WO2, PbO, WO2.72, WO2.90, NiO, WO3, tenorite (CuO), MnO2, and cuprite (Cu2O)(as the metal oxides).

L4 ANSWER 9 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:829485 CAPLUS
TI Pre-impact damage assessment of DRA metal matrix composite encapsulated SiC ceramics
AU Wells, J. M.; Green, W. H.; Rupert, N. L.
CS Army Research Laboratory, Weapons Materials Research Directorate, APG, MD, 21005-5069, USA
SO Ceramic Engineering and Science Proceedings (2002), 23(3), 181-191
CODEN: CESPDK; ISSN: 0196-6219
PB American Ceramic Society
DT Journal
LA English
AB Encapsulation of monolithic ceramic materials is one concept for confinement of candidate **armor** ceramic materials which enables both constraint during ballistic impact and retention of damage fragments for post-impact evaluation by either destructive or non-destructive methods. Non-destructive examn. is essential for the pre-impact baseline characterization of consolidated samples, which subsequently will be tested ballistically and then further characterized for damage in the post-impacted condition. Such non-destructive characterization of exptl. samples of SiC ceramic tile material encapsulated within discontinuously reinforced aluminum metal matrix composite, DRA, was conducted using x-ray computed tomog., CT. Each sample consisted of one 10 cm .times. 10 cm .times. 1.2 cm thick SiC ceramic tile encapsulated with 356/SiCp/60v%DRA forming a test sample of 15.2 cm .times. 15.2 cm .times. 5.3 cm thick overall dimensions. Both digital x-ray radiog. and computed tomog. were performed on the samples using a custom built ACTIS 600/420 x-ray computed tomog. scanner from Bio-Imaging Research, Inc., to characterize and document the "as fabricated" samples prior to planned ballistic testing. Results of three samples fabricated by the pressure infiltration casting

process indicated pre-existing voids in the MMC encapsulant material and substantial multiple cracks in both the MMC and the SiC materials. Such defects in the as-fabricated samples, had they gone undetected, would have been difficult to sep. from later anticipated ballistically-induced damage. Also, significant displacement of the SiC tile was detected indicating an undesired repositioning of the SiC tile during the encapsulation casting step. A subsequent sample fabricated by a pressureless metal infiltration process revealed significantly less extensive cracking than obsd. in the previous samples. This paper discusses the application of x-ray computed tomog. (XCT) to pre-impact characterization of encapsulated ceramic target materials.

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L4 ANSWER 10 OF 2127 CAPLUS COPYRIGHT 2002 ACS
AN 2002:829475 CAPLUS
TI Instrumented Hertzian indentation of **armor** ceramics
AU Wereszczak, A. A.; Kraft, R. H.
CS Metals and Ceramics Research Branch, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD, 21005, USA
SO Ceramic Engineering and Science Proceedings (2002), 23(3), 53-64
CODEN: CESPDK; ISSN: 0196-6219
PB American Ceramic Society
DT Journal
LA English
AB There is commonality between the resulting damage in ballistically tested ceramics and Hertzian indentation. In an effort to study the parameters assocd. with the damage from the latter, a new-instrumented indentation test system was fabricated to facilitate the evaluation of (typically very hard) candidate **armor** ceramics. The indentation results from the testing with this system indicate that the utilization of: a diamond indenter; ultra high-resoln. displacement measurement; a controlled loading/unloading waveform; and a simple mech. analog model can be used in combination to quantify quasi-plastic yield and ring-crack initiation stresses that may be subsequently used to generate a plasticity-fracture map all with a single indent. A description of the test system and the indentation testing and evaluation of a hot-pressed SiC are presented.

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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